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Medical Education in the United States

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DISCOVERIES AND ADVANCES in medical knowledge benefit society only if there is available a large force of well-trained physicians capable of applying such discoveries with intelligence and discrimination to the problems of the individual patient. High standards of medical education are basic to a high quality of medical practice. During the last 50 years the health record of the American people has improved at a rate that has not been approached by any other large nation in history. In this period life expectancy at birth in the United States has increased from 49 years to 68 years. This increase exceeds the total gain in the average span of life from the date of the first scientific mortality table in 1691 to the beginning of the present century. This achievement and the many other unprecedented improvements inscribed in the health records of the American people are in a large measure the direct result of the advances in medical education that have been made during the same period.

Historical Summary

Occasionally it is forgotton that medical education in this country earned the right to be considered a professional discipline only within comparatively recent years. As late as the first decade of the present century the majority of American medical schools had staffs that were inadequate both as to numbers and quality, possessed only meager physical facilities, and conformed to practically no standards. Thus, of the more than 160 medical schools in operation in 1905, only a handful offered an educational program that could be considered adequate in terms of the type of training now generally provided. Of the remainder many were proprietary institutions operated for the profit of their promoters or faculties. Others were outright diploma mills. Standards for admission were practically nonexistent. Even a high-school education was often not required.

During the last quarter of the nineteenth century a few medical schools pioneered in establishing standards comparable to those prevailing in other fields of graduate and professional education. One or more years of college work were made a prerequisite for admission; a nucleus of full-time teachers was employed; well-equipped laboratories for teaching and research were established; bedside instruction was introduced; and the three largely repetitive sessions of 6 months each were replaced by a 4-year graded curriculum.

Except for adopting the 4-year curriculum, the majority of medical schools did not participate in these advances until the period 1905 to 1920, when

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the combined efforts of the Council on Medical Education [1] of the American Medical Association and the Association of American Medical Colleges, acting as accrediting agencies with the support of the State licensing boards, accomplished sweeping reforms in the whole conduct of medical education in the United States. These groups were greatly aided in their work by the survey of the medical schools carried out in 1909 and 1910 by Abraham Flexner for the Carnegie Foundation for the Advancement of Teaching in cooperation with the Council on Medical Education. Mr. Flexner, accompanied by Dr. N. P. Colwell, the first secretary of the Council, inspected every medical school in the Nation. His well-documented report of the low state of many medical schools was widely publicized and impressed both the public and the profession with the need for reform.

Insistence on high standards and classification of schools by the accrediting agencies could not alone have accomplished the revolution in medical education that took place. Large sums of money were necessary to build modern, well-equipped laboratories, libraries, and teaching hospitals and to provide endowments for the support of the relatively large number of instructors required for satisfactory instruction. Foundations, individual philanthropists, and State legislatures provided generous support. It has been estimated that between 1913 and 1930 capital funds totaling at least $200,000,000 were contributed from these sources for the development of medical education in the United States.

Figures are not available for the total amount of additional support of this type that has been provided since 1930. It is known, however, that during this period a number of schools have secured substantial funds from the same sources for their further development. The total probably approaches closely that of the earlier period.

Schools and Enrollments

Detailed statistics and information concerning medical schools, students, and graduates are published annually in the Educational Number of the *Journal of the American Medical Association*. Additional information is presented periodically in the *Journal of the Association of American Medical Colleges*, a publication devoted entirely to the subject of medical education.

[1] In 1920 the name of the council was changed to the Council on Medical Education and Hospitals.

Medical education in the United States today is provided by 72 medical schools and 7 schools of the basic medical sciences which offer the first 2 years of the 4-year medical course. (See accompanying list on p. 212.) Students in the latter schools transfer to a medical school for the work of the last 2 years. The medical school of the University of California at Los Angeles is not included in this number. It is being organized but will probably not be prepared to admit students until 1952.

The national accrediting bodies in the field of medical education are the Council on Medical Education and Hospitals of the American Medical Association [2] and the Association of American Medical Colleges. During the past quarter of a century less than a dozen medical schools failed to meet the standards of these bodies. In 1948 the only surviving unapproved medical school in the United States raised its standards to those of an acceptable school and was admitted to the approved lists of the council and the association.

Sixty-eight of the medical colleges are integral departments of universities; the other 11 are independent institutions without university affiliations; 41 of the schools are owned by private nonprofit corporations; 35 are State-owned, and 3 are municipal institutions. There have been no proprietary medical schools or schools otherwise operated for profit for many years. Over the years, approximately 60 percent of the students and graduates have been from private institutions and 40 percent from tax-supported schools.

The numbers of medical schools, students, and graduates in the United States are shown in the accompanying table for each academic year since 1905. The relatively small size of the 1949 graduating class reflects the fact that when this class was admitted to medical school during the academic year 1945–46 it was the smallest freshman class since 1940. This class was selected during the last year of the war when there was no provision for the deferment of premedical students by the Selective Service System. As a consequence, medical schools were unable to find a sufficient number of qualified students to fill the available places in their freshman classes.

On the basis of enrollments in the freshman, sophomore, and junior classes in 1948–49, it may be

[2] The Council consists of seven members, elected for 7-year terms, by the House of Delegates of the American Medical Association. One term expires each year.

predicted that beginning in 1950 the annual number of graduates will total at least 5,600. This figure, which exceeds by approximately 10 percent the average annual number of graduates for the 15 years 1931–45, reflects the effort that has been made by all schools since the end of the war to accept the maximum number of students they could accommodate without seriously lowering the quality of their educational programs.

Medical Schools, Students, and Graduates in the United States, 1905–49 [1]

[Students in the schools of the basic medical sciences are included; students in the required intern year are not included]

Year	Schools	Students	Graduates
1905	160	26, 147	5, 606
1910	131	21, 526	4, 440
1915	96	14, 891	3, 536
1920	85	13, 798	3, 047
1921	83	14, 466	3, 186
1922	81	15, 635	2, 529
1923	80	16, 960	3, 120
1924	79	17, 728	3, 562
1925	80	18, 200	3, 974
1926	79	18, 840	3, 962
1927	80	19, 662	4, 035
1928	80	20, 545	4, 262
1929	76	20, 878	4, 446
1930	76	21, 597	4, 565
1931	76	21, 982	4, 735
1932	76	22, 135	4, 936
1933	77	22, 466	4, 895
1934	77	22, 799	5, 035
1935	77	22, 888	5, 101
1936	77	22, 564	5, 183
1937	77	22, 095	5, 377
1938	77	21, 587	5, 194
1939	77	21, 302	5, 089
1940	77	21, 271	5, 097
1941	77	21, 379	5, 275
1942	77	22, 031	5, 163
1943	76	22, 631	5, 223
1944	77	23, 529	5, 134
1944 (second session)	77	24, 666	5, 169
1945 (to June 30)	77	24, 028	5, 136
1946 (to May 31)	77	23, 216	[2] 5, 826
1947 (to June 30)	77	23, 900	[3] 6, 389
1948 (to June 30)	77	22, 739	5, 543
1949 (to June 30)	78	[3] 23, 670	5, 094

[1] *Journal of the American Medical Association*, Vol. 141, p. 33 (Sept. 3, 1949).
[2] Several schools graduated two classes during the year on the wartime accelerated program.
[3] The 167 students at the University of Washington are not included in this total since this school, which opened in 1946, had only 3 years in operation and was not included in the official statistics for 1948–49.

The average size of the freshman class in medicine in the 10 years preceding the recent war was 6,016. In 1948, 6,688 freshmen were admitted, the largest freshman class on record. The most recent estimate for 1949–50 indicates that the freshman class is slightly in excess of 7,000 students.[3]

As a result of the increase in enrollment it is expected that the physician population of the United States will continue, as it has continued since 1929, to increase relatively more rapidly than the general population. In 1929 there were 125 licensed physicians per 100,000 persons in the United States. By 1948 the ratio was 137 licensed physicians for every 100,000 persons.

In the early 1920's the number of applicants for admission to medical schools for the first time exceeded the number of places available in the freshman classes of the medical schools. In the years just before World War II there were approximately two applicants for every available place. This situation made it possible for the medical schools to become increasingly selective in accepting students for admission. However, even with the large number of applicants, well-qualified students rarely encountered difficulty in securing admission to medical schools. On the contrary, before the war most medical schools in order to fill the last 10 to 20 percent of places in their freshman classes accepted students whose academic records, while satisfactory, did not conclusively demonstrate a capacity to complete successfully the medical school course.

With the end of the war there was a sharp increase in the number of applicants to medical schools. Thus in the past 3 years there have been between three and four applicants for every available place.[4] This development has resulted primarily because a large number of men were unable during the war years to complete their college training or to initiate their professional education. To some extent it is also a reflection of an increasing interest in the study of medicine. During the past 3 years many schools, contrary to their prewar experience, have had to refuse admission to a certain number of fully qualified applicants. This situation is expected to be temporary. Once the backlog of veterans has been accommodated, the number of applicants will probably be greatly reduced.

Attrition in medical schools is less than in other schools of professional training. However, even though medical schools exercise great care in the selection of students and the number of capable applicants has increased, about 15 percent of all students who enter medical school do not graduate. Prior to the war the rate of attrition was approximately 25 percent.

Medical education requires close personal supervision of students. Each student must be provided with facilities for individual work in laboratories and hospitals. As a consequence, enrollments in the individual schools are measured in hundreds

[3] It is estimated that the total number of medical students enrolled in all four classes in 1949–50 is approximately 24,800.

[4] The medical schools have officially reported to the Association of American Medical Colleges that a total of 24,011 persons applied for admission to the 1948 freshman class. This class numbered 6,688 students.

rather than thousands. For the academic year 1948–49 enrollments ranged from 148 to 653 students in the 4-year schools, the average being 313 and the median 303.

For the two decades prior to the war, women averaged about 5.2 percent of all medical students and medical graduates. Toward the end of the war increasing numbers of women were admitted to medical school. By the academic year 1947–48 women constituted 9.5 percent of all medical students, the highest percentage of women students ever recorded. A reversal of this trend is now taking place, and women constituted only 6 percent of the 1948 freshman class.

Cost of Medical Education

Medical education is generally considered to be the most expensive type of education. During the academic year 1949–50 it is estimated that the medical schools will spend a total of $61,000,000 in conducting their programs. This sum does not include the much larger cost of operating the teaching hospitals nor approximately $25,000,000 that the schools will receive in the form of special grants for research and teaching from outside agencies.

Of the $61,000,000 of institutional funds that will be required to operate the medical schools in the coming year, only $13,900,000 or 22.8 percent of the total will be derived from student fees. Tuition fees for resident students will range in 1949–50 from $113 to $830, the average being $548 and the median $577.

Premedical Education

The Council on Medical Education and Hospitals in 1914 established 1 year of college training as the minimum requirement for admission to approved medical schools. In 1918 this requirement was raised to 2 years. Since 1938 the council has recommended, but not required, that at least 3 years of college work be required of all candidates for admission. At present 73 of the 79 medical and basic science schools require three or more years of premedical work.

Statistics for the freshman class that entered medical school during the academic year 1948–49 reveal that 55.4 percent had a bachelor's degree, 8.3 percent had attended college for 4 years without receiving a degree, 35.5 percent had had 3 years of college work, and only 0.8 percent had had but 2 years of college training.

Candidates for admission to approved medical schools must meet certain qualitative as well as quantitative requirements. The minimum qualitative requirements include the following college courses: 1 year of physics, 1 year of biology, 1 year of general chemistry, and 1 year of organic chemistry. Several schools have additional specific requirements in scientific and nonscientific subjects. In recent years a number of medical schools have recognized that the tradition for premedical students to take a preponderance of scientific courses in college has been carried to undesirable limits and have eliminated such additional requirements in an effort to encourage prospective students of medicine to acquire a broad general education. Practically all schools advise students not to pursue in college courses that will be required in medical school.

Undergraduate Curriculum

Undergraduate medical education has several important objectives. The primary one is to make certain that all students granted the degree of doctor of medicine have acquired the fundamental knowledge and habits of work essential for the safe and intelligent practice of medicine.

Medical education also seeks to develop the student's interest in the unknown and to acquaint him sufficiently with the principles of scientific investigation so that he is prepared to judge critically the many scientific papers and discussions to which he must devote his attention as long as he remains active in medicine. Through inculcating in the student the spirit and principles of scientific investigation, the schools have the further objective of increasing the possibility that the student will in time himself contribute to the advance of medical knowledge either through investigations at the bedside or in the laboratory.

The basic medical school course required by all medical schools is 4 years in length. Six schools require in addition that their students serve a year of internship before the degree is granted. This is not an important distinction since more than 99 percent of the graduates of all schools take at least 1 year of internship.

The first 2 years of the medical school course are devoted largely to study in the laboratory of the basic or preclinical sciences including anatomy, physiology, biochemistry, pathology, pharmacology, and bacteriology. During this period the student is expected to master both principles and detailed knowledge of the normal structure and function of the human body, the causative agents of disease,

and the changes in structure and function that are the result of disease. He is also introduced to methods and agents for the prevention and treatment of disease.

The last 2 years of the medical school course are devoted to clinical subjects, including medicine, surgery, pediatrics, psychiatry, obstetrics, public health, and the various medical and surgical specialties. Except for one or two lectures a day, the student's time is spent in hospitals and out-patient departments working with patients under supervision. During this time he learns to take case histories, perform examinations, and recognize the various manifestations of disease. He is required to become familiar with the course of all important diseases, their complications, and sequelae and to observe and become familiar with their treatment.

In the last 25 years great advances have been made in applying the methods and knowledge developed in the preclinical sciences to the problems of clinical medicine. As a result of this development and the contributions of psychiatry, which have reemphasized the importance of considering every patient as a whole and not in terms of isolated organs or diseases, an increasing effort is being made in most schools to effect more correlation and integration between the various courses that are given during the four undergraduate years. This has resulted in an increasing interplay among departments in the conduct of courses. Likewise, it has led to the introduction of preliminary instruction in clinical subjects into the first 2 years of the medical school course and an extension of instruction in the preclinical sciences into the last 2 years.

While the emphasis placed on different subjects varies somewhat from school to school, the general plan of medical education in all schools follows a fairly basic pattern. Thus, while one school may stimulate more interest in research, teaching, or the practice of a specialty and another school more interest in the general practice of medicine, the curriculums of all schools are sufficiently uniform so that the graduates of no school are limited by their training as to the type of future career they may elect to pursue.

Upon the completion of the medical school course, the student is awarded the degree of doctor of medicine. The degree no longer confers the right to practice medicine, but entitles its holder to take the examination for licensure of the State or States in which he desires to practice. Each State has its own licensing authority, and, while the examinations of one State or the examinations of the National Board of Medical Examiners may be accepted by other State boards in lieu of additional examinations, a physician must secure a license in each State in which he undertakes to practice his profession.

Graduate Medical Education

Although 24 States still permit a physician to be licensed immediately upon graduation from medical school, it is generally recognized that before a physician is adequately prepared to assume the responsibilities involved in the practice of medicine he should have at least 1 year of hospital training after graduation from medical school. Consequently, almost without exception, graduates who plan to practice first take 1 year or more of internship training in 1 of the 800 hospitals approved for such training. During the internship the physician follows intimately the course of several hundred patients with a wide variety of diseases. Under the close supervision and instruction of senior physicians, he is allowed to take progressively more responsibility in the care of patients. Thus while increasing his knowledge, he develops confidence born of experience in his ability to diagnose and treat patients.

If a physician intends to specialize, he must take 2 to 4 years of additional hospital training as a resident after completing his internship if he wishes to qualify for certification by one of the American Boards in the Specialties. At present there are more than 1,300 hospitals throughout the country that have been approved for residency training in the various medical and surgical specialties.

In addition to taking hospital training through internships and residencies, many physicians engage in graduate study as fellows in medical schools and hospital laboratories. Such training is usually taken by men who are interested in careers in research or teaching, but many who intend to practice take at least 1 year of fellowship training. Graduate work of this type may or may not lead to an advanced degree. During the academic year, 1948–49, 1,133 physicians were enrolled in courses leading to advanced degrees.

Postgraduate Medical Education

A physician's education is not completed when he has finished his hospital training, but is a continuing process to which he must devote himself as long as he continues in practice. Advances in

medicine occur so rapidly that the physician who does not keep abreast of progress in medical science becomes incapable of properly treating the majority of his patients within a few years. Each year more than one-third of the physicians of the country enroll in one or another type of formal postgraduate course. In addition to attending such courses, physicians continue their education by the regular reading of medical journals, more than 500 of which are published in the United States alone, by participating in weekly or monthly hospital staff conferences, and by attending the local, State, or national meetings of one or more of the two-hundred-odd scientific societies and organizations active today in the field of medicine.

Research

Medicine is forced to deal so largely with the unknown, and consequently with attempts to penetrate the unknown, that a good teacher of medicine must be actively interested in medical research if his teaching is to be vital and stimulating. Recognition of this principle has led in this country to the inseparable combination of teaching and medical research. Thus the faculties of the medical schools and the staffs of their affiliated hospitals constitute the country's most fruitful source for advances in the understanding and control of disease.

Research is today listed among the important activities of every medical school. In some institutions research programs greatly exceed the undergraduate teaching program in the demands that they make on the staff and facilities of the institution. The contribution of such schools must be measured not only in terms of the importance of the investigations in progress but also in terms of the number of investigators and teachers they train for positions of leadership in other institutions throughout the country. It can safely be said that continuing progress in medical education is more dependent on a continuing growth of the spirit of scientific inquiry in our medical schools than on any other single factor.

Community Service

In many regions and communities the medical schools with faculties of highly trained experts, well-equipped laboratories, and teaching hospitals possess the outstanding medical personnel and facilities in the entire area. As a consequence, such schools are looked to for guidance and active participation in community and regional health programs. Almost every major new program in the field of health and medical care proposed in recent years has been planned to center about medical schools. Thus medical schools are being called on to sponsor and participate in regional and community plans for hospital organization, for postgraduate and graduate training, for public health activities, for coordinated research, for laboratory services, and for the development of special clinics for the control and treatment of cancer, tuberculosis, psychiatric disorders, venereal diseases, and other conditions of importance to the public health.

It is proper and desirable that medical schools should undertake to make some direct contribution to the community or region in which they are located. It must be recognized, however, that the assumption by the medical schools of responsibility for community service is accompanied by certain dangers. Unless the resources of the schools can be increased, their limited staffs and facilities may be diverted too widely from their primary task of education and research. These are functions which the schools alone can perform and which in the long run will contribute more to the improvement of health and medicare than any number of specific service programs in which a school may participate.

Present and Future Problems

Despite the advances that have been made in medical education, the medical schools have never been without problems. Nor does it appear likely that medical educators will ever be satisfied with either the progress or the product of medical education.

Supply of physicians.—One of the most pressing problems with which the schools are concerned at present is the adequacy of the supply of physicians. A number of extreme predictions of anticipated shortages of physicians were published about 2 years ago. Warnings were issued that unless the medical schools increased the number of their graduates by 50 to 100 percent during the next 10 to 15 years the country's health would be menaced. If these claims had been true it would have been necessary to conclude that the country had been suffering from a critical shortage of physicians for a great many years, years during which its health improved at an unprecedented rate. As already pointed out, the number of physicians per unit of population has increased progressively for the past 20 years and is continuing to increase.

There are good reasons, however, for believing that the country could use more physicians. The problem facing the medical schools is to determine first what the reasonable needs of the country for physicians are, and second how they can accommodate additional students without lowering the quality of their instructional programs or their graduates. The problem is being met in what would appear to be the only practical way. The medical schools are accepting the maximum number of students for which they have facilities, and, where expansion is feasible, they are seeking additional support to provide enlarged facilities. In this manner a progressive increase in the number of medical graduates is being achieved without the deterioration in the quality of medical education that would have been inevitable if the schools had attempted to increase enrollments abruptly.

Unlike some subjects, medicine does not lend itself to the type of expansion that can be accomplished by putting additional chairs in the back of the classroom and asking the instructor to speak a little louder. Before accepting additional students, a medical school must secure additional laboratory space and equipment, hospital facilities, and trained teachers. Experience has demonstrated that the time required for the intelligent planning and execution of such developments is measured in years and not in weeks or months.

In addition to the expansion of existing schools that is taking place, serious consideration is being given to the establishment of new medical schools in several States. It is the opinion, therefore, of the majority of the medical profession and of medical educators that no disturbing shortage of physicians is in prospect. Medical educators are ready and eager to cooperate in effecting any reasonable expansion of the facilities for medical education that the public is willing to support.

Qualified instructors.—During the recent war practically no young men were permitted to take the training necessary for a career of teaching in a medical school. The shortage of trained personnel that resulted when added to the relatively low salary scales prevailing in many schools has made it difficult for the medical schools to fill vacant or newly created positions on their teaching staffs. Thus the medical schools as a group have reported that as of June 1949, 10 percent of their full time teaching positions were unfilled. The difficulty that the schools are encountering in finding a sufficient number of well-qualified instructors emphasizes one of the problems that must be faced in any attempt to expand the facilities for medical education.

Financial support.—The financial problems of the medical schools have been given much publicity in the past 3 years. A number of medical schools have never enjoyed proper financial support, and almost all schools have had difficulty in securing adequate funds in recent years. It is beyond the scope of this article to discuss this problem in detail. It can be said that further improvement in the quality of medical education, as well as any major increase in the facilities for medical education, is dependent on additional financial support being made available to the medical schools.

Several schools have been highly successful in the past year or two in securing additional support from local sources. It appears likely, however, that the problems of many schools can be met only by the establishment of a national organization to obtain funds from voluntary sources for the support of the medical schools or by appropriations from the Federal Government or both. Steps to make both types of support a reality are being taken at the moment.

Should Federal funds be made available to the medical schools, it is to be hoped the Government will have the wisdom to resist any temptation to dictate policies or otherwise interfere with the conduct of the medical schools. The great progress which has been made in medical education and research in this country has been due in a large measure to the freedom and independence that the schools have had to develop their own programs. The preservation of this freedom and independence is the best assurance that the country can have that progress will continue unabated.

Teaching methods and the curriculum.—While concern about enrollments and financial problems has tended to dominate discussions of medical education in recent years, the more fundamental problems of teaching methods and the curriculum have been receiving continuing study. Periodic realignment of the curriculum in medical education is made necessary by three forces that are continually at work: Advances in medical knowledge which may increase or decrease the relative importance of various subjects, changes in the form of medical practice such as the increased tendency toward specialization and the further development of group practice, and changes in the pattern of graduate medical

education. Further, as the amount of factual data increases it becomes necessary either to lengthen the period of training or to discover more effective teaching methods.

There is an almost universal desire to reexamine the curriculum and to determine if it is meeting the needs of the modern graduate. The emphasis given to and the method of presenting many of the standard subjects need to be reviewed. A number of new subjects or old subjects to which new importance has recently been attached are waiting to be evaluated and assigned their proper place in the curriculum.

Progress has been made in several schools in introducing teaching methods that are conducive to increasing the student's initiative and his capacity for independent work. However, probably the most serious criticism that can be made of medical education as it has developed in this country is that the willingness of the medical schools to grant the individual student more freedom in planning and executing his work has not kept pace with the increasing capacity of the modern medical student to accept such responsibility. Altogether too much spoonfeeding and minute surveillance of students survive for a discipline that attracts mature and serious students.

The other fundamental criticism which can be directed at medical education today is its failure in most instances to stimulate the student to view medicine broadly in its relationship to the other concerns of man and society. So demanding and absorbing is the study of medicine that it is all too easy for the student to permit his thinking and interest to become isolated from the past and present struggles of man and society to advance spiritually, culturally, economically, and politically. There is good evidence to indicate that the medical schools have an important responsibility to assist their students more than they have in the past, to acquire a proper perspective of the role that medicine plays in assisting individuals and groups to achieve their destinies.

Selection of students.—There are few problems to which the medical schools are giving more attention than that of finding improved methods for the selection of students. Each school is continually analyzing its own procedures. A special committee of the Association of American Medical Colleges has had this subject under close study for several years. This committee is sponsoring the administration of a special aptitude test by the Educational Testing Service and other research projects designed to discover the most satisfactory techniques and criteria for the selection of students. The importance of such studies can be determined from the fact that a reduction of only 1 percent in the percentage of failures in each entering class for the schools of the country as a whole would represent an increase in the annual number of graduates equivalent to the graduating class of an average-sized medical school.

Survey of Medical Education

The value of periodic surveys of all medical schools has been established by the Flexner survey in 1909 and 1910 and by the survey carried out by Dr. Herman G. Weiskotten in 1934–36 for the Council on Medical Education and Hospitals.

A third major survey of medical education in this country was initiated on January 1, 1949. Details concerning this survey, which is being conducted under the auspices of the Council on Medical Education and Hospitals and the Association of American Medical Colleges, were described in an earlier issue of this publication (March 15, 1949). Visits to the medical schools began in September 1949. During the next two academic years, teams composed of two or three men will visit every medical school in the United States, spending approximately 5 to 10 days at each school. At the conclusion of the field work a comprehensive report will be prepared and published. It may safely be predicted that this report, like the reports of previous surveys, will have an important effect on the training of physicians for many years to come.

Medical and Basic Medical Science Schools in the United States

[The figures indicate the enrollments in 1947–48, not including students in the required intern years. The (*) indicates a basic medical science school]

Alabama
Medical College of Alabama, 186.

Arkansas
University of Arkansas School of Medicine, 303.

California
University of California Medical School, 283.
College of Medical Evangelists, 327.
University of Southern California School of Medicine, 262.
Stanford University School of Medicine, 242.

Colorado
University of Colorado School of Medicine, 251.

Connecticut
Yale University School of Medicine, 231.

District of Columbia
Georgetown University School of Medicine, 389.
George Washington University School of Medicine, 320.
Howard University College of Medicine, 275.

Georgia
Emory University School of Medicine, 234.
University of Georgia School of Medicine, 302.

Illinois
Chicago Medical School, 235.
Northwestern University Medical School, 525.
Stritch School of Medicine of Loyola University, 295.
University of Chicago, The School of Medicine, 246.
University of Illinois College of Medicine, 653.

Indiana
Indiana University School of Medicine, 438.

Iowa
State University of Iowa College of Medicine, 299.

Kansas
University of Kansas School of Medicine, 334.

Kentucky
University of Louisville School of Medicine, 362.

Louisiana
Louisiana State University School of Medicine, 322.
Tulane University of Louisiana School of Medicine, 499.

Maryland
Johns Hopkins University School of Medicine, 293.
University of Maryland School of Medicine and College of Physicians and Surgeons, 337.

Massachusetts
Boston University School of Medicine, 237.
Harvard Medical School, 511.
Tufts College Medical School, 390.

Michigan
University of Michigan Medical School, 469.
Wayne University College of Medicine, 227.

Minnesota
University of Minnesota Medical School, 426.

Mississippi
University of Mississippi School of Medicine,* 54.

Missouri
St. Louis University School of Medicine, 431.
University of Missouri School of Medicine,* 87.
Washington University School of Medicine, 351.

Nebraska
Creighton University School of Medicine, 248.
University of Nebraska College of Medicine, 302.

New Hampshire
Dartmouth Medical School,* 46.

New York
Albany Medical College, 186.
Long Island College of Medicine, 416.
University of Buffalo School of Medicine, 259.
Columbia University College of Physicians and Surgeons, 436.
Cornell University Medical College, 319.
New York Medical College, Flower and Fifth Avenue Hospitals, 446.
New York University College of Medicine, 478.
University of Rochester School of Medicine and Dentistry, 268.
Syracuse University College of Medicine, 191.

North Carolina
Duke University School of Medicine, 277.
University of North Carolina School of Medicine,* 110.
Bowman Gray School of Medicine of Wake Forest College, 186.

North Dakota
University of North Dakota School of Medicine,* 58.

Ohio
University of Cincinnati College of Medicine, 327.
Ohio State University College of Medicine, 322.
Western Reserve University School of Medicine, 325.

Oklahoma
University of Oklahoma School of Medicine, 259.

Oregon
University of Oregon Medical School, 273.

Pennsylvania
Hahnemann Medical College and Hospital of Philadelphia, 366.
Jefferson Medical College of Philadelphia, 635.
University of Pennsylvania School of Medicine, 474.
University of Pittsburgh School of Medicine, 303.
Temple University School of Medicine, 461.
Woman's Medical College of Pennsylvania, 161.

South Carolina
Medical College of the State of South Carolina, 216.

South Dakota
University of South Dakota School of Medical Sciences,* 56.

Tennessee
Meharry Medical College, 231.
University of Tennessee College of Medicine, 578.
Vanderbilt University School of Medicine, 200.

Texas
Baylor University College of Medicine, 306.
Southwestern Medical School of the University of Texas, 238.
University of Texas School of Medicine, 374.

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Congressional Activities of Interest to Higher Education

FOUR MAJOR BILLS of interest to higher education are pending before the Congress as this issue goes to press.

NATIONAL SCIENCE FOUNDATION

S. 247, the National Science Foundation Act, has passed both the House and the Senate and was sent to conference on March 27. The conferees made their report on April 26, and it was adopted by the House the following day. The provision of the House bill requiring FBI certification of employees and scholarship holders has been deleted, and in its place there have been introduced (1) security regulations similar to those of the Atomic Energy Commission and the National Defense Establishment for employees and scholarship holders having access to classified information, and (2) a provision requiring all scholarship holders to take an oath similar to that taken by members of the Congress.

LOANS FOR STUDENT AND FACULTY HOUSING

S. 2246, authorizing loans to educational institutions for the purpose of constructing student and faculty housing, was passed by the House and Senate, and on April 20 it was signed by the President. (Public Law 475, 81st Congress.) The conference report, submitted on April 5, provides for a

$300,000,000 fund for direct loans to colleges, for housing for students and faculty, at an interest rate equal to that specified in the most recently issued bonds of the Federal Government having a maturity of 10 years or more, determined at the date the contract for the loan is made, plus one-fourth of 1 percent. Copies of the act may be had on request from the Division of Higher Education, Office of Education.

Extension of Social Security

The Senate Committee on Finance has completed hearings on H. R. 6000 and is now marking up the bill for a report to the Senate. H. R. 6000, passed by the House October 5, 1949, amends the Social Security Act to extend its coverage to the faculties of educational institutions, among others. The employee's tax, under H. R. 6000, would be imposed compulsorily on employees of nonprofit institutions other than ministers and members of religious orders, but the employer's tax could be imposed only by the voluntary election of the employer. Should the employer not elect to pay the employer's tax, the employee would receive credit with respect to one-half his wages. H. R. 6000 would apply to employees of State and local governments only if the State enters into a voluntary compact with the Federal Security Agency, provided that such employees who are under an existing retirement system shall be covered only if such employees and adult beneficiaries of the retirement system shall so elect by a two-thirds majority.

Land-Grant Colleges

H. R. 7057, passed by the House March 20, 1950, amends a veteran's regulation with respect to computation of costs of teaching personnel and supplies for instruction in land-grant colleges and universities and other nonprofit educational institutions. It provides that in the computation of such costs no reduction shall be made by reason of any payments to the land-grant colleges under the Morrill Act, as amended and supplemented, and that in the case of any nonprofit educational institution, no reduction shall be made by reason of any payments to such institution from State or municipal or other non-Federal public funds, or from private endowments or gifts or other income from public sources. The Senate Committee on Labor and Public Welfare is now holding hearings on H. R. 7057 and S. 2909, a similar bill.

NEW PUBLICATIONS

Annotations by Elizabeth N. Layton
Research Assistant
Higher Education Division

Government Publications

How To Obtain

(*1*) *Cost Publications: Send request, enclosing remittance (check or money order), to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.*

(*2*) *Free Publications: Request direct from the agency issuing them.*

From the Office of Education

Engineering Enrollments and Degrees, 1949, by Robert C. Story and Henry H. Armsby in cooperation with the American Society for Engineering Education, Division of Higher Education. (Circular No. 266, March 20, 1950). 18 p. (Proc.) Free.

First of a series of annual reports. Presents total enrollments and degrees conferred at the bachelor's, master's, and doctor's levels, in the several engineering fields, based on an October 1949, survey of all institutions listed in the Office of Education *Directory of Higher Education*, that had reported degrees in engineering during 1948–49; 180 institutions reported data for this study.

From Other Government Agencies

House of Representatives. *Message from The President of the United States, February 13, 1950*, transmitting Reports of the Administrator of Veterans' Affairs and the Director of the Bureau of the Budget Relative to the "Original Sound Intent of the Servicemen's Readjustment Act." Washington: House of Representatives. 81st Cong., 2d sess. (H. Doc. 466).

Joint report of the Administrator of Veterans' Affairs and the Director of the Bureau of the Budget. Contains brief statement of history and evident intent of the Servicemen's Readjustment Act (Public Law 346, 78th Cong.), and the earlier act for veterans with service-connected disabilities (Public Law 16, 78th Cong.); summary of currently available facts relating to problems which have arisen, particularly in connection with courses below college level; contemplated administrative action and recommendations and suggestions.

Pan American Union. *Courses on Latin America in Institutions of Higher Education in the United States, 1948–49*, Estellita Hart, comp., introduction by Jorge Basadre. Washington, D. C., Pan American Union, 1949. 364 p. Paper, $1.50.

Data from 875 institutions of higher education concerning the 3,346 courses they offer on Latin America. For each course gives title, instructor, credit, short description of content, textbook used, principal reference works, and other details, including enrollment. The 65-page introduction describes the evolution of Latin American studies in the United States and presents a summary of their current status. Institutions arranged alphabetically. Indexes of institutions, officers of instruction, and subjects.

Pan American Union. *Opportunities For Summer Study in Latin America, 1950.* Washington 6, D. C., Pan American Union, 1950. 23 p. Mimeo. Free.

Part I describes summer school courses offered by Latin-American institutions; part II, summer school courses offered by United States institutions in Latin-American countries; part III, educational tours in Latin-American countries. Also contains table of estimated round-trip costs of transportation to locations of summer schools.

Non-Government Publications

The Centennial Celebration of Hollins College. Hollins College, Va., The College, 1949. 178 p.

Proceedings of the celebration, including a number of addresses on educational, religious, political, and other subjects.

College Programs in Intergroup Relations: A Report by Twenty-four Colleges Participating in the College Study in Intergroup Relations, Lloyd Allen Cook, ed. Washington, American Council on Education, 1950. 366 p. $3.75.

Reports a pioneer attempt to teach techniques for improving intergroup relations. More than 200 concrete projects were carried on. The 4-year project was supported by the National Conference of Christians and Jews. The aim is twofold—"to impress prospective teachers with the importance of their role in the elimination of prejudice among their pupils, and to equip them with the tools and the methods with which to deal with intergroup prejudices." A second volume is to follow.

4th and 5th Congress on Dental Education and Licensure, 1948–49. Chicago, Ill., American Dental Education, 1950. 113 p.

The 4th Congress was devoted to (1) teaching and licensing in dentistry, two papers; and (2) the specialties in dentistry, six papers. The 5th Congress dealt with: (1) methods of teaching and examining in the basic sciences, three papers; and (2) methods of teaching and examining in the clinical subjects, three papers. Summaries of the discussions are also included.

Music: An Art and a Business, by Paul S. Carpenter. Norman, Okla., University of Oklahoma Press, 1950. 246 p. $3.75.

Deals with (1) what is happening to music as the agencies of production, performance, and transmission are coming under centralized systems of control; (2) the musical situation of the American composer, the conditions which determine the kind of music the American public hears; and (3) the professional training of musicians and composers.

Trends in Medical Education, Mahlon Ashford, ed. New York, The Commonwealth Fund, 1949. 320 p. $3.

Proceedings of the New York Academy of Medicine Institute on Medical Education, 1947. Reports six panel discussions in which experts presented appropriate topics and exchanged views, after which general discussion took place. The six general topics were: (1) Premedical Education and the Selection of Medical Students; (2) Undergraduate Medical Education; (3) The Medical Education of Interns and Residents; (4) Graduate and Postgraduate Training for Specialization; (5) The Responsibility of Medical Schools and Hospitals in the Education of the General Practitioner; and (6) The Relation of Group Practice and Community Medical Services to Medical Education. A total of 54 persons participated in the panel discussions.

Annual Report, Social Science, Research Council, 1948–49. New York 17 (230 Park Avenue), N. Y., The Council, 1950. 63 p.

A Bibliography in General Education. Chicago, Ill., Journal of General Education, The University of Chicago [1949]. 32 p. Paper, 35 cents. For sale by the American Association of Junior Colleges, 1201 19th St., NW., Washington 6, D. C.

A reprint of: (1) A Bibliography in General Education, by Earl J. McGrath, originally published in *The Educational Record*, Vol. 21 (1940), p. 96–118, 421 titles; (2) A Further Bibliography on General Education, by William Nelson Lyons, originally published in *The Journal of General Education*, Vol. 4 (1949), p. 72–80, 237 titles; and (3) Index of *The Journal of General Education*, Vols. 1–3, 137 titles.

Blueprint for Understanding: A Thirty Year Review, by the Institute of International Education, Inc. New York 19 (2 West 45th St.), N. Y., The Institute. 1949. 48 p. Illus.

This 30-year review of the activities of the institute in the exchange-of-persons movement and of other contributions to the further development of international good will describes many phases of the organization, such as its personnel, programs, impediments, and support.

Builders of American Universities, Vol. I, David A. Weaver, ed. Alton, Ill., Shurtleff College Press, 1950. 381 p. $3.

First of a series of 3 volumes presenting inaugural addresses of college and university presidents. This volume contains addresses of 19 presidents of privately controlled institutions. Among these presidents are such well-known men as Charles W. Eliot, Woodrow Wilson, Nicholas Murray Butler, David Starr Jordan, and G. Stanley Hall. The first of the addresses was by Mark Hopkins (1836) at Amherst College, and the last was by Guy E. Snavely (1921) at Birmingham-Southern College.

The Federal Government and Education, by Hollis P. Allen. New York, McGraw-Hill Book Co., Inc., 1950. 333 p. $4.

The original and complete study of education for the Hoover Commission Task Force Report on Public Welfare. Describes the Federal activities in education, suggests changes in these activities and their organization, and outlines a suggested Federal policy and structure for education. Presents opinions of numerous persons and organizations regarding Federal relations to education. Devotes one chapter to the Office of Education.

A Program for Near Eastern Studies in the United States—Report of the Committee on Near Eastern Studies, American Council of Learned Societies Washington, D. C., The Council, 1949. 38 p. Free.

Report points out lack of opportunity for learning about the Near East in American colleges and universities, small amount of research on the Near East published by trained American scholars, and inadequacy of courses in basic history and Near Eastern languages in American higher education institutions. Presents recommendations for a long-range program suggesting (1) that universities and colleges place Near East studies in as many pertinent departments as possible and establish new department where desirable; (2) that a field training program be established to obtain accurate first-hand information in the Near East; (3) that the most significant modern books and periodical literature of the Near East be translated into English and published; (4) that fellowships be established for different aspects of study of the Near East; and (5) that summer institutes and seminars be set up on the Near Eastern civilization. The committee estimates that a 3-year program would cost the institutions $425,000 which might be raised with the assistance of foundations and other interested organizations.

A Study of the Achievement of College Students in Beginning Courses in Food Preparation and Serving and Related Factors, by Mary Keeling Wilson. New York, Bureau of Publications, Teachers College, Columbia University, 1949. 81 p. $2.35.

Report of a study concerned with two questions: (1) What factors are related to the knowledge and skills in food preparation exhibited by students? (2) Do students who have studied the subject before coming to college know more about food preparation and serving, and possess more skills in it than other students?

The Theory and Practice of Teaching, by Ernest E. Bayles. New York, Harper & Brothers, 1950. 362 p. $3.

Following two introductory orientation chapters, the volume outlines a theory of teaching which grows out of a consideration of the nature of society, learners and the learning process, and subject matter. In the next part the principles are applied to all levels of teaching. Each chapter contains illustrative units in almost every field of the curriculum. The final chapter deals with classroom tests. The chapter on higher education contains 40 pages and includes 7 illustrations of teaching.

Proceedings of the Thirty-fifth Annual Meeting of the Association of Urban Universities at Chicago, October 31, 1949. Twenty-sixth Report. Ypsilanti, Mich., University Lithoprinters [1949]. 95 p.

Scholarships, Fellowships, and Loans, by S. Norman Feingold. Boston, Mass., Bellman Publishing Co., Inc., 1949. 254 p. $6.

Complete information on nearly $20 million worth of educational aids—several thousand scholarships, fellowships, and loans administered by nearly 300 agencies. Scholarships, fellowships, and loans are listed alphabetically in the text according to the administering agency and alphabetically by name and donor as well as by administering agency in the index. The aids listed are not usually found in college catalogs. Includes a section on "Planning Your Career."

University Research and Patent Problems, by Archie M. Palmer. Washington 25, D. C., Patent Policy Survey, National Research Council, 1949. 83 p. Proc. $1.

Composite report of the five regional conferences on university research and patent problems, held by the National Research Council's Patent Policy Survey in Denver, Berkeley, Chicago, New York, and Atlanta, last spring. Contains summary digests of the proceedings of each conference and composite résumé of the research and patent problems discussed; organized in chapters under following topical groupings: Need for a university patent policy, unorganized research, organized research, sponsored research, patent management, and principles and considerations involved in formulating research and patent policies. Final chapter contains comment of the conference participants on the value of the conferences and on university patent policies in general.

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